Sub B1

7. (NEW) A cross-connect waveguide system comprising:

a planar lightguide circuit having one or more optical paths;

a plurality of optical waveguides coupled to said planar lightguide circuit;

a plurality of filtering devices for feeding light energy into said optical paths of said planar lightguide circuit or receiving light energy from said optical paths of said planar lightguide circuit; and

a diverting element for feeding first light energy at a predetermined wavelength having first information content away from said planar lightguide circuit, and for feeding second light energy at said predetermined wavelength having second information content into said planar lightguide circuit.

2 ~~8~~. (NEW) The cross-connect waveguide system of claim 1 ~~7~~, wherein said diverting element comprises a double-sided mirror.

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9. (NEW) The cross-connect waveguide system of claim 7, wherein said diverting element is remotely configurable.

10. (NEW) The cross-connect waveguide system of claim 9, wherein said diverting element is controlled with optically encoded information.

11. (NEW) The cross-connect waveguide system of claim 9, wherein said diverting element is controlled by a dedicated control signal of light energy.

12. (NEW) The cross-connect waveguide system of claim 9, wherein said diverting element is controlled by address headers of light energy containing configuration instructions.

13. (NEW) The cross-connect waveguide system of claim 9, wherein said diverting element is controlled by sampling the first light energy.

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5 ~~14~~. (NEW) The cross-connect waveguide system of claim 1 ~~7~~, wherein said diverting element is moveable between a first position and a second position.

6 ~~15~~. (NEW) The cross-connect waveguide system of claim 5 ~~14~~, wherein said diverting element feeds said first light energy away from said planar lightguide circuit when said diverting element is in said first position, said diverting element feeds said second light energy into said planar lightguide circuit when said diverting element is in said first position, and said diverting element passes said first light energy into said planar lightguide circuit when said diverting element is in a second position.

7 ~~16~~. (NEW) The cross-connect waveguide system of claim 1 ~~7~~, further comprising a monitor disposed within an optical path of said first light energy.

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8 ~~17~~. (NEW) The cross-connect waveguide system of claim 7 ~~16~~, wherein said monitor comprises a beam splitter.

9 ~~18~~. (NEW) The cross-connect waveguide system of claim 7 ~~16~~, wherein said monitor samples active and dark power status of an optical waveguide.

10 ~~19~~. (NEW) The cross-connect waveguide system of claim 7 ~~16~~, wherein said diverting element is remotely configurable.

11 ~~20~~. (NEW) The cross-connect waveguide system of claim 10 ~~19~~, wherein said diverting element is controlled by sampling said first light energy with said monitor.

12 ~~21~~. (NEW) The cross-connect waveguide system of claim 1 ~~7~~, wherein said diverting element connects two or more optical networks together.

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13 ~~22.~~ (NEW) The cross-connect waveguide system of claim 1 ~~7,~~ wherein said diverting element exchanges light energy of different wavelengths between one or more optical networks.

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23. (NEW) A method for adding and dropping light energy with multiple information contents comprising the steps of:

feeding multiplexed light energy into a planar lightguide circuit;

demultiplexing the light energy by dropping first light energy at a predetermined wavelength having first information content from said planar lightguide circuit; and

generating control signals to activate a diverting element to feed the first light energy away from said planar lightguide circuit while feeding second light energy at said predetermined wavelength having second information content into said planar lightguide circuit for multiplexing with light energy in said planar lightguide circuit; and

generating control signals to de-activate said diverting element to feed the first light energy into said planar lightguide circuit for multiplexing with light energy in said planar lightguide circuit.

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24. (NEW) The method of claim 23, wherein the steps of generating control signals further comprise the step of encoding control information within an optical signal.

27 ~~25.~~ (NEW) The method of claim 26 ~~23,~~ wherein the steps of generating control signals further comprise the step of encoding control information within a dedicated control signal of light energy.

28 ~~26.~~ (NEW) The method of claim 26 ~~23~~, wherein the step of generating control signals to activate a diverting element further comprises the step of positioning a double-sided mirror within an optical path of said first light energy.

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29 ~~27.~~ (NEW) The method of claim 26 ~~23,~~ further comprising the step of monitoring the first information content of said first light energy.

30 ~~28.~~ (NEW) The method of claim 26 ~~23~~, further comprising the steps of:

sampling the first information content of said first light energy, and

in response to sampling the first information content, generating said control signals for said diverting element.

14 ~~29.~~ (NEW) The cross-connect waveguide system of claim 1 ~~7,~~ wherein one or more of the filtering devices comprise dielectric, thin-film interference filters.

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15 ~~30.~~ (NEW) The cross-connect waveguide system of claim 1 ~~7,~~ wherein one or more of the filtering devices have a predetermined packing density in excess of ninety percent.

16 ~~31.~~ (NEW) The cross-connect waveguide system of claim 15 ~~30,~~ wherein the packing density is above ninety-nine percent.

17 ~~32.~~ (NEW) The cross-connect waveguide system of claim 1 ~~7,~~ wherein one or more of the filtering devices comprise rugate filters.

18 ~~33.~~ (NEW) The cross-connect waveguide system of claim 1 ~~7,~~ wherein the one or more optical paths of said planar lightguide circuit comprise at least one of silica, plastic, BK-7, or a low expansion optical material.

19 ~~34.~~ (NEW) The cross-connect waveguide system of claim 1 ~~7,~~ wherein the one or more optical paths of said planar lightguide circuit comprise circuit patterns made from at least one of etching and photolithographic techniques.

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